

ASEAN University Network/ South-East Asian Engineering and Education Development Network



Post Graduate Education and Interdisciplinary Research Program for Geohazard Mitigation



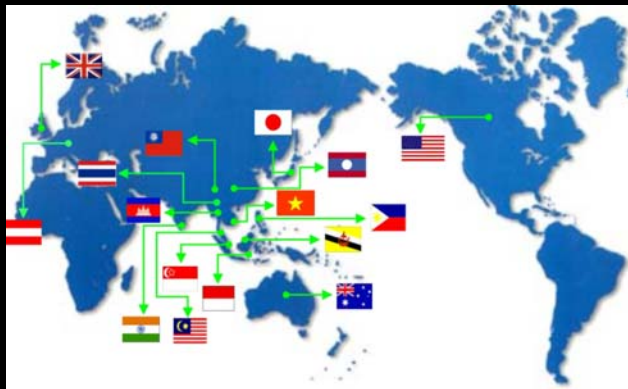
Background of AUN/SEED-Net

- AUN/SEED-Net, ASEAN University Network/ Southeast Asia Engineering Education Development Network, was established in 2001
- Operated fully since 2003 with the aim at promoting human resources development in engineering in ASEAN through the establishment of the network of 19 leading institutions from 10 ASEAN countries with the support of 11 leading Japanese Universities
- Mainly supported by the Japanese government through JICA (Japan International Cooperation Agency)
- The project was decided to extend another 5 years (March 2008 to March 2013) as Phase 2



Yogyakarta earthquake, 2006

Partnership in Research & Education on Geological Eng & Disaster Mitigation Program AUN/ SEED NET + LINKAGE WITH UK & USA



9-field Consortium of Graduate Schools of Engineering

Host Field	Host Institution	Field Coordinating U
1. Civil	CU	Hokkaido U
2. Chemical	DLSU	Tokyo IT
3. Electrical/Electronics	CU	Tokyo IT
4. Environmental	UP	Tokyo IT
5. Geological & Disaster Mitigation UGM		Kyoto U
6. Information/Communication	KMITL	Tokai U
7. Manufacturing	UM	Keio U
8. Materials	USM	Toyohashi UT
9. Mechanical/Aeronautical	ITB	Toyohashi UT

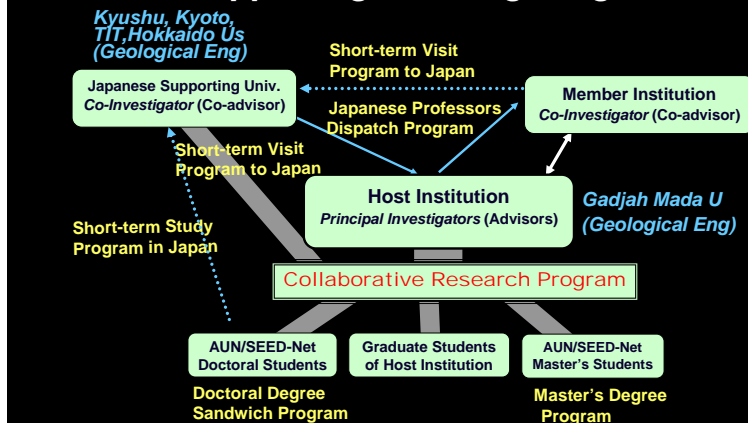
Field of Geological Engineering and Interdisciplinary field in Disaster Mitigation

Goal & mission

- Capacity building for sustainable geo-resources management and **geo-disaster risk reduction**, with respect to the sustainable socio-economical development of ASEAN.



Design of Education & the Supporting Learning Program



Student-Centered Learning Program in the class and field





2nd Phase of SEED Net Program (2008 – 2013)



AUN/SEED-Net JICA

Umbrellas of Interdisciplinary Research in Disaster Mitigation for Sustainable Development

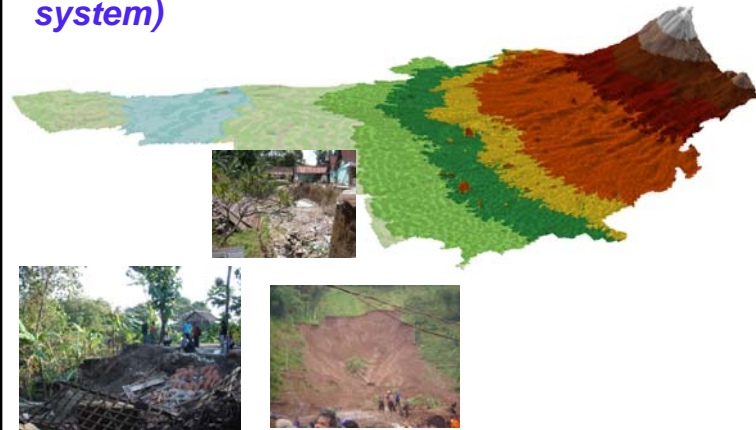
- Landslide mechanism, prediction, risk reduction and early warning system
- Debris flood risk reduction and early warning system
- Earthquake hazard and risk analysis
- Water-disaster risk reduction
- Geotechnical hazard prediction and risk reduction



AUN/SEED-Net JICA

Landslide hazard and risk mapping for landuse management in DRR

Landslide hazard and risk mapping in DRR (for landuse mangement and early warning system)

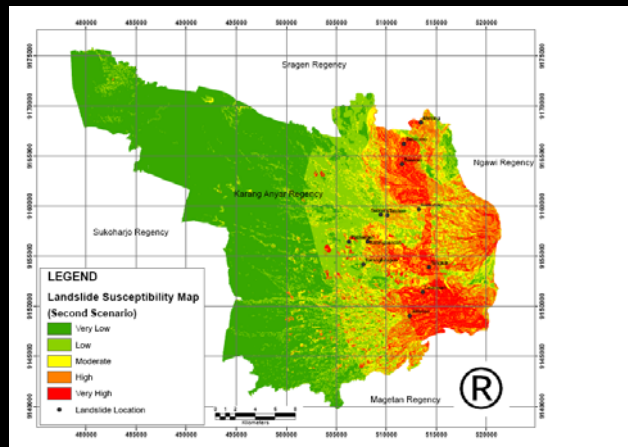


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Debris Flood at Leuser National Park & Bukit Lawang (due to unappropriate landuse management)

Doc : Bakornas PBB, 2003

Landslide hazard map with respect to high intensity of rainfall (January-April) in Karanganyar, scale 1 : 100,000



PETA ZONA TINGKAT KERENTANAN GERAKAN MASSA TANAH DAN BATUAN

Level of susceptibility
 Kontur
 Jalan
 Low
 Medium

PETA ZONA TINGKAT RESIKO GERAKAN MASSA TANAH DAN BATUAN

Level of risk
 Kontur
 Jalan
 Low
 Moderate
 High

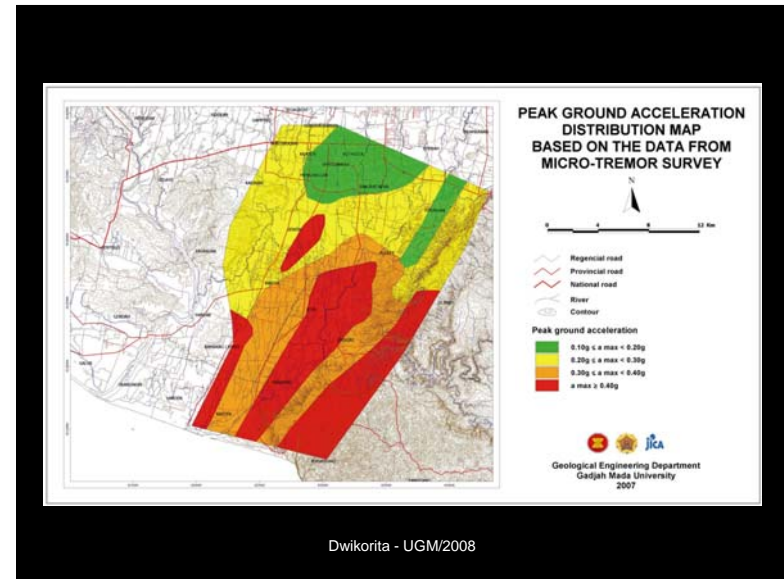
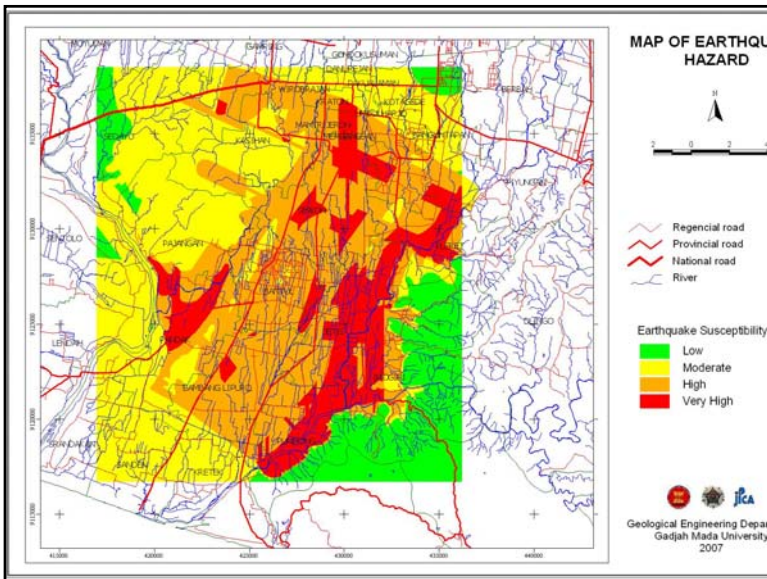
Landslide hazard map At Mundon Village (scale 1 : 25,000)

Landslide risk map At Mundon Village Scale (1 : 25,000)

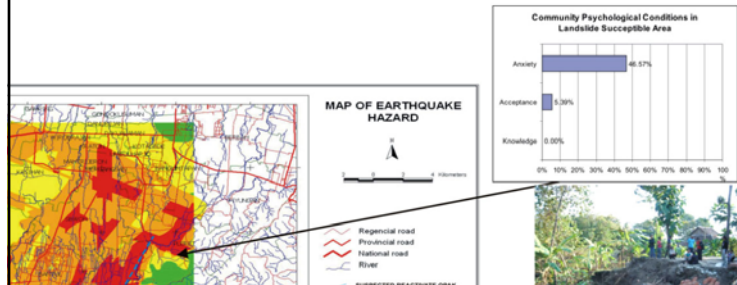
Earthquake hazard mapping for landuse management



Geotechnical Drilling and site investigation for development of earthquake microzonation map



Community Hazard Map

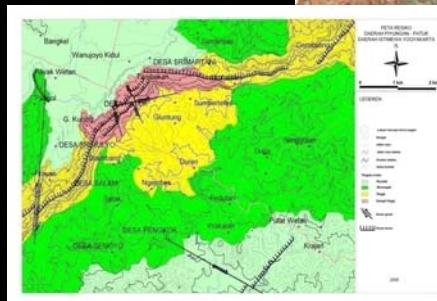


Dwikorita - UGM/2008

Geotechnical hazard prediction and risk mapping for tunnel construction in earthquake vulnerable area



Remote Sensing For Tunneling Risk Assesment (Karnawati, et al, 2005)



Transfer of knowledge & development of indigenous technology for landslide early warning system





Technology learned from Japan

ICT

*Visualization & telemetry
Early Warning System*



Development of Community-based landslide early warning system



AUN/SEED-Net **JICA**

Manual Extensometer



Automatic Rain gauge



Development of Indigenous Technology for Landslide Early Warning System

Dissemination & Evacuation Drill in response to landslide early warning



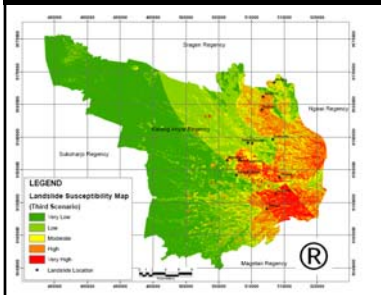
NEEDS & Challenges

- The availability of **online MULTI-hazard** data-based and information at the local, national and regional scale (trans-boundary database)
- Updated geo-information data to support the early warning, preparedness and emergency response

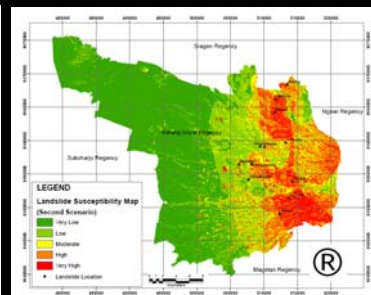
GAP and challenges

- Access to online updated data of geo-information.
- Access to special tool for online data analysis (software vs sopen source?).

Spatial & temporal online landslide hazard map with respect to high intensity rainfall



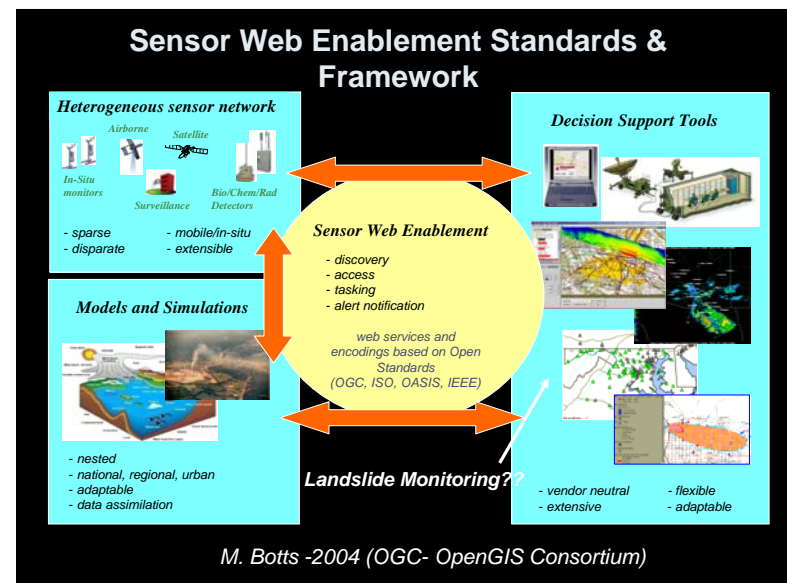
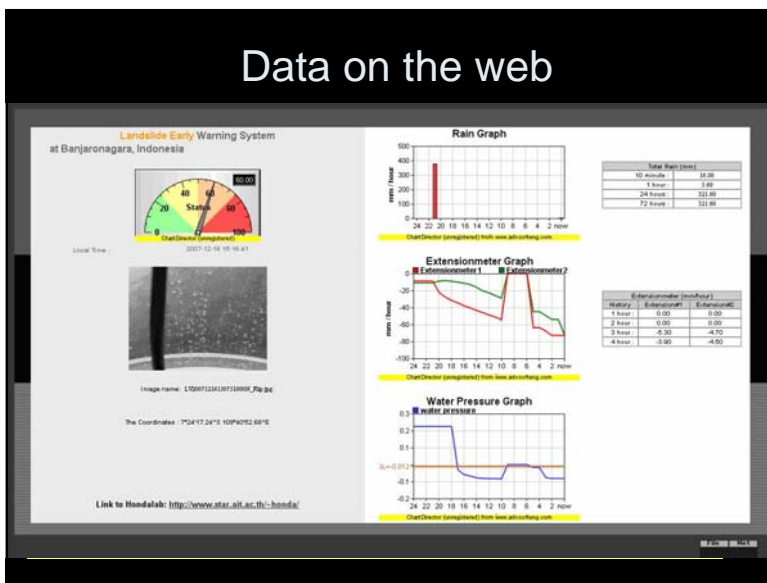
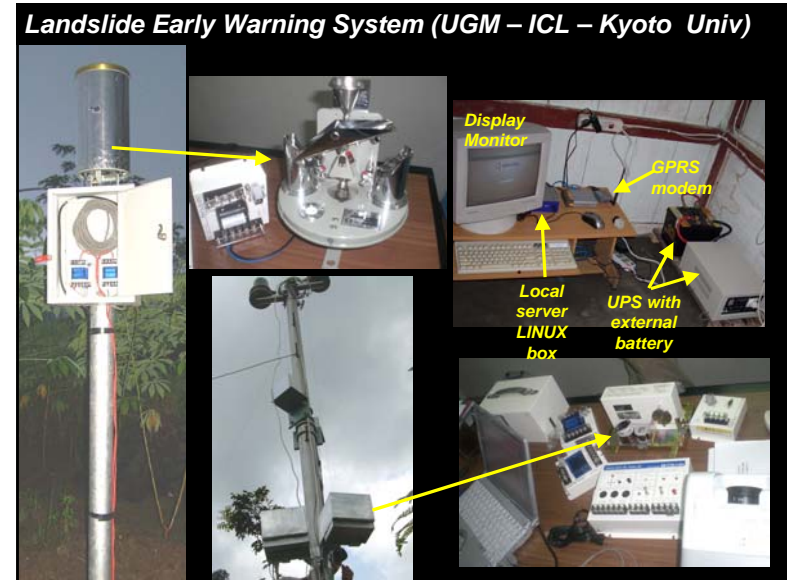
Early rainy season :
(Nov – January)



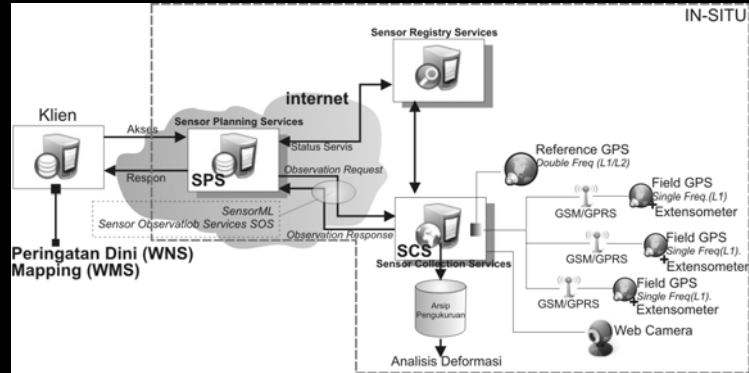
Mid rainy season :
(February - March)

Emergency reponse to mitigate the potential debris flood

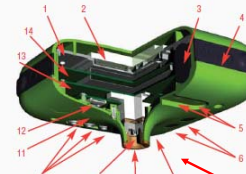




Desing of OpenGIS SWE for landslide EWS with GPS online



GPS Referensi

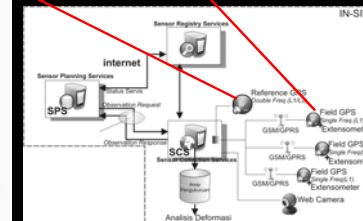


1. Ground Plane
2. Internal GNSS Antenna
3. Rechargeable Li-Ion Battery Pack
4. Guard Bumper
5. 1PPS and Event Marker Connectors (optional)
6. On/Off and Control Buttons and LEDs
7. Bluetooth / WiFi Antenna
8. 5/8-11" Mounting Thread
9. UHF / GSM Antenna Connector
10. Communication and Power Ports
11. SIM Card Door
12. User Accessible SIM Card
13. GNSS Receiver and Power Board with on-board Memory
14. GNSS RF and Communication Board with on-board SIM Card

Field sensor



Web Extensometer



Thank you